Toothbrush

The invention relates to a toothbrush according to the preamble of claim 1.

Toothbrushes are available on the market in a wide range of different configurations. The aesthetic effect of a toothbrush often plays a significant role in the task of selecting the same. In particular in the case of children's toothbrushes, design and color are of considerable importance and a humorous appearance increases the enjoyment of teeth cleaning. The intention here is for it to be possible for toothbrushes to be mass-produced as cost-effectively as possible.

--BRIEF SUMMARY OF THE INVENTION--

The object of the present invention is to provide a toothbrush which has attractive design possibilities and can nevertheless be produced cost-effectively.

This object is achieved according to the invention by a toothbrush having the features ~~of claim 1~~.

Preferred developments of the toothbrush according to the invention ~~form the subject matter of the dependent claims~~.

---BRIEF DESCRIPTION OF THE DRAWINGS---

The invention is explained in more detail hereinbelow with reference to the drawing, in which:

Figure 1 shows a side view of a toothbrush;

Figure 2 shows a plan view of the toothbrush according to Figure 1;

Figure 3 shows a bottom view of the toothbrush according to Figure 1, a closure part for closing a handle cavity being illustrated

separately from the rest of the toothbrush part;

Figures 4 to 10 show different exemplary embodiments of means which can be inserted into the handle cavity in order to achieve an aesthetic effect;

Figure 11a shows a plan view of a second embodiment of a closure part for closing the handle cavity, with an integrated positioning element;

Figure 11b shows a front view of the closure part according to Figure 11a;

Figure 11c shows a side view of the closure part according to Figure 11a;

Figure 12a shows a plan view of another positioning element which can be connected to a closure part;

Figure 12b shows a front view of the positioning element according to Figure 12a;

Figure 12c shows a side view of the positioning element according to Figure 12a;

Figure 13a shows a plan view of a further positioning element which can be connected to a closure part;

Figure 13b shows a front view of the positioning element according to Figure 13a;

Figure 13c shows a side view of the positioning element according to Figure 13a;

Figure 14a shows a plan view of a third embodiment of a closure part for closing the handle cavity, with an integrated positioning element;

Figure 14b shows a front view of the closure part according to Figure 14a;

Figure 14c shows a side view of the closure part according to Figure 14a;

Figure 15 shows, on an enlarged scale and in partial section, the toothbrush according to Figures 1 to 3, a fourth embodiment of a closure part for closing a handle cavity being illustrated separately from the rest of the toothbrush part;

Figure 15a shows a longitudinal section of the closure part according to Figure 15;

Figure 15b shows a securing part, as seen in arrow direction A, for an ampoule accommodated in the handle cavity of the toothbrush according to Figure 15;

Figure 16a shows, on an enlarged scale and in a side view, a further exemplary embodiment of a closure part; and

Figure 16b shows a longitudinal section of the closure part according to Figure 16a.

dno 247

Figures 1 to 3 illustrate a manual toothbrush 1 which has a front bristle-carrying head part 2 and a rear handle 3. The bristles or clusters of bristles (not illustrated in the drawing) are anchored in a manner known per se in the depressions 4 provided for this purpose in the head part 2. The longitudinal axis of the toothbrush 1 is designated L in Figures 1 to 3. The

handle 3, over at least part of its length, is provided with an essentially cylindrical cutout 5 which extends in the longitudinal direction of the toothbrush 1 and forms a cavity 7 in the handle 3. The cutout 5 is open to the rear. Provided for closing the cavity 7 is a closure part 8 which can be seen from Figure 3 in particular and can be inserted into the cutout 5, by way its offset part 8a, from the rear and is connected to the handle 3. This may be a releasable connection of the two parts (for example snap-in connection, screw connection, bayonet connection, etc.) or a non-releasable connection (weld connection including connection by means of high-frequency welding, adhesive bonding, non-releasable snap-in connection, etc). The purpose of the closeable cavity 7 is described hereinbelow.

The handle 3 and the head part 2 are advantageously produced by multi-component injection molding, an at least partially transparent material component being used for the handle 3. This may be, for example, styrene acrylonitrile (SAN). It would also be possible, in principle, for the head part 2 to consist of this material, i.e. for the two toothbrush parts 2, 3 to be produced from the transparent material by conventional injection molding. Such a toothbrush would be particularly cost-effective since SAN is inexpensive. It is preferable, however, to select for the front bristle-carrying head part 2 a material other than SAN, for example polypropylene (PP), which is more resistant to aggressive teeth-cleaning substances (e.g. peppermint oil). Since these two materials do not join during the injection molding, the two toothbrush parts 2, 3 are preferably provided with interengaging parts (protrusion/recess) on their contact surfaces, with the result that the two plastic parts are brought into form-fitting connection during the injection molding. Such a connection is indicated in Figures 1 to 3 and is designated 10. It would also be conceivable, however,

to have a force-fitting connection between the two plastic parts, e.g. in the manner of a shrinkage connection.

Both the handle 3 and the head part 2a may have parts which consist of further material components and help to improve the aesthetic effect and/or the grip. It is also the case, for example, that the handle 3 is provided with a depression 12, which can be seen from Figures 1 and 2, for a thumb rest 11 which consists of an elastically compliant material, for example a thermoplastic elastomer (TPE).

The cutout 5 or the cavity 7 of the handle 3 is produced by encapsulating a core by injection molding and hollowing out the same.

Different means for achieving an aesthetic effect may be accommodated in the cavity 7, which can be closed by means of the closure part 8, as will now be described hereinbelow.

The cavity 7 may be filled directly with decorative articles or playthings, e.g. different figures, snowflakes, shiny particles, etc. It is also possible for a liquid to be introduced directly into the cavity 7. This liquid may also contain floating articles. A powder or sand filling is also possible. Hologram foils or luminescent parts may also be accommodated in the cavity 7.

It is also possible, however, for a roll 14, e.g. made of cardboard or plastic, which is illustrated in Figure 4 and preferably has multicolored printing on it, to be inserted into the cavity 7. Figure 5 illustrates a roll 15 which can be inserted into the cavity 7 and has a film adhesively bonded to it. It is also possible, however, for a section of film which has printing on it to be rolled together and pushed directly into the

cavity 7. Said section of film may also be at least partially transparent or translucent, this giving the person looking at it an illusion of depth or the impression of a three-dimensional image.

A further possibility is for the rolls 14, 15 or the section of film to be configured so as to achieve the effect of moving images. The lenticular production of such moving images is described in EP Patent Application No. 99 118 775.8.

Furthermore, it is also possible to provide the rolls 14, 15 with holes or openings through which it is possible to see printing (image, text) in the opposite region of the inner wall of the rolls 14, 15, the illusion of depth being achieved as a result. It is also possible for the section of film to have such holes, through which it is possible to see the printing opposite, with the effect of depth being achieved. It is also possible in this way to produce the impression of a three-dimensional image.

It is also possible, on occasion, to insert filled ampoules into the cavity 7, as the examples illustrated in Figures 6 to 10 show. Thus, the ampoule 16 illustrated in Figure 6 contains a liquid with floating articles, the ampoule 17 according to Figure 7 contains loose articles and the ampoule 18 according to Figure 8 merely contains a liquid. The ampoule 19 according to Figure 9 is filled with a fine-grain material (powder, sand). A gas filling would also be possible. Figure 10 shows an ampoule 20 which has printing on it. The ampoule could also have a film adhesively bonded to it. It would also be possible for the abovementioned hologram foils or luminescent parts to be accommodated in the interior of an ampoule and inserted, with the latter, into the cavity 7.

In the case of a releasable connection between the closure part 8 and the handle 3, it is possible to exchange the cavity contents. In particular the abovementioned rolls 14, 15 or the different ampoules 16 to 20 can easily be exchanged, which allows a rapid change in design. It is possible for at least partially transparent handles of different outer shapes to be provided with the essentially cylindrical cutout 5 and filled, for example, with the rolls 14, 15 or the ampoules 16 to 20. In addition to, or instead of, means with an aesthetic effect, it would also be possible for useful articles, such as toothpicks, exchangeable ampoules with mouthwash or toothpaste, to be accommodated in the cavity 7.

Instead of the cap-like closure part 8 which is illustrated in Figures 1 to 3, it is possible to use, for the purpose of closing the cavity 7, a closure part 22 which can be seen from Figures 11a to 11c, is provided with a helical positioning element 23 and by means of which the toothbrush can be positioned on an underlying surface. Instead of the helical positioning element 23 it would also be possible for the closure part to be provided with a sun-like positioning element 24 according to Figures 12a to 12c or a star-shaped positioning element 25 according to Figures 13a to 13c. The positioning elements 24, 25 are each provided with a depression 26 for a fixed connection to a closure cap (not illustrated).

A further embodiment of a possible closure part 27 is illustrated in Figures 14a to 14c. This closure part 27, which can be inserted into the cutout 5 by way of its offset part 27a and can be connected either releasably or non-releasably to the handle, has a star-shaped positioning part 28.

Of course, it would also be possible for the positioning parts 24, 25 or 28 to have some other basic outline.

The handle 3 of the toothbrush 1' according to Figure 15 is provided with a securing means 31 which is located in the front region of the cutout 5 and is intended for the insert located in the cavity 7, for example the ampoule 30. The securing means 31 has an annular part 31a, which can be seen from Figure 15b, is made of an elastically compliant material and is provided with a number of rearwardly directed tongues 31b which extend in the longitudinal direction of the toothbrush 1' and are arranged in the form of a circle. For example, it is possible for the securing means 31, like the head part 2, to consist of polypropylene (PP) and to be injection molded in the same step as said head part (the connecting channel provided for this purpose is designated 32 in Figure 15). The closure part 8' is also provided with a number of tongues 35, which extend in the longitudinal direction of the toothbrush 1', are arranged in the form of a circle, and are directed forward. When the cavity 7 is closed, the ampoule 30 is forced between the elastically compliant tongues 31b, on the one hand, and the likewise elastically compliant tongues 35 on the other hand, and is kept in its position both radially and axially by said tongues.

It is also the case that the closure part 37, illustrated in Figures 16a and 16b, is provided with the abovementioned tongues 35 for securing the cavity insert. This closure part 37 is formed integrally with a positioning part 38, which is provided with a planar standing surface 39, at right angles to the longitudinal axis L, for setting the toothbrush in the upright position. The standing surface 39, is, if appropriate, of annular configuration. The closure part 37 is inserted, by way of its offset part 37a, into the

handle cutout 5 of the toothbrush and, in the process, snaps onto the handle 3 by way of its plug-on border 37b.

In order to set the toothbrush in the upright position, it would also be possible to use a closure part with a rearwardly rounded positioning part and an integrated weight for producing a "stand-up" effect.

Examples of possible material for the transparent handle 3, in addition to the abovementioned SAN, are polystyrene or polyester.

In particular in the case of a releasable connection to the handle 3, the closure parts 8, 8', 22, 27, 37 are preferably produced from a thermoplastic elastomer (TPE), a good sealing action being achieved as a result.

Instead of filling the handle cavity from the rear, for example, with an ampoule, it would also be possible for the ampoule to be embedded in the handle by being encapsulated in the transparent material by injection molding. In this case, however, it would no longer be possible to exchange the cavity contents.

~~Patent Claims~~

1. A toothbrush which has a bristle-carrying front head part (2) and a handle (3) and is produced by conventional or multi-component injection molding, wherein the handle (3), over at least part of its length, has an essentially cylindrical and closed cavity (7) extending in the longitudinal direction of the toothbrush, at least that part of the handle (3) which encloses the cavity (7) consisting of an at least partially transparent material.

2. The toothbrush ~~as claimed in claim 1, wherein means~~ having devices with an aesthetic effect are accommodated in the closed cavity (7).

3. The toothbrush ~~as claimed in claim 1 or 2,~~ wherein the cavity (7) is kept closed from the rear by means of a closure part (8; 8'; 22; 27) which can be connected non-releasably to the handle (3) at the rear end of the latter.

4. The toothbrush ~~as claimed in claim 1 or 2,~~ wherein, for optionally filling the cavity (7), the cavity (7) can be closed from the rear by means of a closure part (8; 8'; 22; 27; 37) which can be connected releasably to the handle (3) at the rear end of the latter.

5. The toothbrush ~~as claimed in claim 2 and claim 4,~~ wherein the ~~means~~ devices are accommodated in an ampoule (16; 17; 18; 19; 20) which can be inserted into the cavity (7).

6. The toothbrush ~~as claimed in claim 2 and claim 4,~~ wherein the ~~means~~ devices are formed by a roll (14; 15), preferably made of plastic or cardboard, which has

printing on it or has a film adhesively bonded to it.

7. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by an at least partially transparent or translucent section of film which butts against the inner wall of the cavity and has printing on it.

8. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by loose articles.

9. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by a liquid.

10. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by a liquid containing floating articles.

11. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by sand or powder.

12. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by luminescent parts.

13. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by hologram foils.

14. The toothbrush ~~as claimed in one of claims 2 to 4,~~ wherein the ~~means~~ devices are formed by a gas.

15. The toothbrush ~~as claimed in claim 1 or 2~~ and ~~claim 3~~, wherein the ~~means~~ devices are formed by an ampoule (20) which has printing on it or has a film adhesively bonded to it.

16. The toothbrush ~~as claimed in claim 3 or 4,~~ wherein the closure part (22; 27; 37) is provided with a positioning part (23; 24; 25; 28; 38) for

positioning the toothbrush (1) on an underlying surface.

17. The toothbrush ~~as claimed in claim 16,~~ wherein the positioning part (38) has a planar standing surface (39) at right angles to the longitudinal axis (L) of the toothbrush and closure part.

18. The toothbrush ~~as claimed in one of claims 3, 4, 16 and 17~~, wherein the closure part is produced from a thermoplastic elastomer (TPE).

19. The toothbrush ~~as claimed in claim 4 and either of claims 5 and 15,~~ wherein the ampoule (16; 17; 18; 19; 20) is kept in its position in the cavity (7) by a securing means (31, 35).

20. The toothbrush ~~as claimed in claim 19,~~ wherein the securing ~~means~~ devices (31, 35) comprises rearwardly directed tongues (31b) which are arranged in the front region of the handle cavity (7), extend in the longitudinal direction of the toothbrush, are made of an elastically compliant material and are arranged in the form of a circle, it being the case that, when the cavity (7) is closed by the closure part (8'; 38), the ampoule (16; 17; 18; 19; 20) is kept in its position between said tongues (31b) and forwardly directed tongues (35) of the closure part (8'; 38), which are likewise arranged in the form of a circle, extend in the longitudinal direction of the toothbrush and consist of an elastically compliant material.

21. The toothbrush ~~as claimed in claim 3,~~ wherein the closure part (8; 8'; 22; 27) is connected to the handle (3) by welding, preferably high-frequency welding, or adhesive bonding or a non-releasable snap-in connection.

22. The toothbrush ~~as claimed in claim 4,~~ wherein the closure part (8; 8'; 22; 27; 37) is connected to the handle (3) by a releasable snap-in connection or a screw connection or a bayonet connection.

23. The toothbrush ~~as claimed in claim 1 or 2 and as claimed in claim 4,~~ wherein useful articles such as toothpicks or an ampoule with mouthwash or toothpaste are accommodated in the closed cavity (7).